The Modular Mandelbrot set

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Holomorphic correspondences are multi-valued maps defined by polynomial relations $P(z, w) = 0$. We consider a specific 1-(complex)parameter family of correspondences (introduced by Bullett and Penrose in 1994), and we show that these correspondences are matings between the modular group and the family of quadratic rational maps $P_A(z) = z + 1/z + A$: encode the dynamics of both objects. Also, there exists a dynamical homeomorphism between the modular Mandelbrot set (this is, the connectedness locus of this family of correspondences) and the parabolic Mandelbrot set (the connectedness locus of the family $P_A(z)$, and is itself homeomorphic to the classical Mandelbrot set by a result of Petersen and Roesch). The talk is based on joint work with Shaun Bullett.